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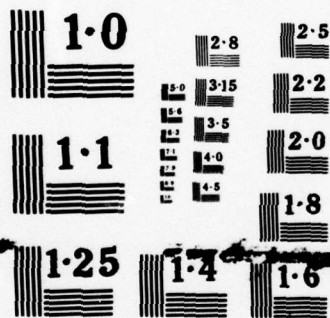
NEW JERSEY STATE DEPT OF ENVIRONMENTAL PROTECTION TRENTON F/G 13/2
NATIONAL DAM SAFETY PROGRAM. STONY BROOK DAM, NUMBER 3 (NJ00389--ETC(U)
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NATIONAL BUREAU OF STANDARDS
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RARITAN RIVER BASIN
STONY BROOK TRIBUTARY
MERCER COUNTY
NEW JERSEY

LEVEL

STONY BROOK DAM
NO. 3

NJ 00389

MA069226

PHASE 1 INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

Stony Brook Dam, Number 3 (NJ00389).
Raritan River Basin, Stony Brook Tributary,
Mercer County, New Jersey. Phase 1 Inspection
Report.

Approved for public release;
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9 Final Rept.,
F. Keith Jolls



15 DACW61-78-G-0124

DEPARTMENT OF THE ARMY

Philadelphia District
Corps of Engineers
Philadelphia, Pennsylvania

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| 1. REPORT NUMBER NJ00389 | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER |
| 4. TITLE (and Subtitle) Phase I Inspection Report National Dam Safety Program Stony Brook Dam, No. 3 Mercer County, N.J. | | 5. TYPE OF REPORT & PERIOD COVERED FINAL |
| 7. AUTHOR(s) F. Keith Jolls, PE | | 6. PERFORMING ORG. REPORT NUMBER |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS Louis Berger & Assoc. 100 Halstead St. East Orange, N.J. 07019 | | 8. CONTRACT OR GRANT NUMBER(s) DACW61-78-C-0124 |
| 11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Engineer District, Philadelphia Custom House, 2d & Chestnut Streets Philadelphia, Pennsylvania 19106 | | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) | | 12. REPORT DATE May, 1979 |
| | | 13. NUMBER OF PAGES 62 |
| | | 15. SECURITY CLASS. (of this report) Unclassified |
| | | 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE |
| 16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited. | | |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) | | |
| 18. SUPPLEMENTARY NOTES Copies are obtainable from National Technical Information Service, Springfield, Virginia, 22151. | | |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Spillway Dams Structural Analysis Visual Inspection National Dam Inspection Report Safety Stony Brook Dam No. 3, N.J. | | |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report. | | |

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7 MAY 1979

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Stony Brook Dam No. 3 in Mercer County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Stony Brook Dam No. 3, initially listed as a high hazard potential structure but reduced to a low hazard potential structure as a result of this inspection, is judged to be in good overall condition and the spillway is considered adequate. The low hazard potential classification means that in the event of failure of the dam, no loss of life and only minimal economic loss is expected. The following remedial actions could be undertaken by the owner:

- (1) Regrade the eroded backslopes and sides and reseed the barren areas.
- (2) Continue monitoring the backslope seepage and the subgrade drains.
- (3) Consider providing additional training for park personnel relative to maintenance and inspection.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman James A. Courter of the Thirteenth District. Under the provisions of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

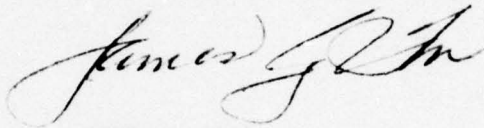
NAPEN-D

Honorable Brendan T. Byrne

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Safety Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,



JAMES G. TON
Colonel, Corps of Engineers
District Engineer

1 Incl
As stated

Copies furnished:
Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N. J. Dept. of Environmental Protection
P. O. Box CN029
Trenton, NJ 08625

John O'Dowd, Acting Chief
Bureau of Flood Plain Management
Division of Water Resources
N. J. Dept. of Environmental Protection
P. O. Box CN029
Trenton, NJ 08625

STONY BROOK DAM NO. 3 (NJ00389)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 8 December 1978 by Louis Berger and Associates, Inc. under contract to the State of New Jersey. The State, under agreement with the U. S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

Stony Brook Dam No. 3, initially listed as a high hazard potential structure but reduced to a low hazard potential structure as a result of this inspection, is judged to be in good overall condition and the spillway is considered adequate. The low hazard potential classification means that in the event of failure of the dam, no loss of life and only minimal economic loss is expected. The following remedial actions could be undertaken by the owner:

- (1) Regrade the eroded backslopes and sides and reseed the barren areas.
- (2) Continue monitoring the backslope seepage and the subgrade drains.
- (3) Consider providing additional training for park personnel relative to maintenance and inspection.

APPROVED: 

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

DATE: 7 May 1979

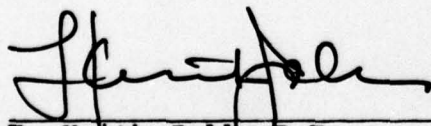
PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

Name of Dam Stony Brook Dam No. 3 Fed ID# NJ 00389
NJ ID# 584

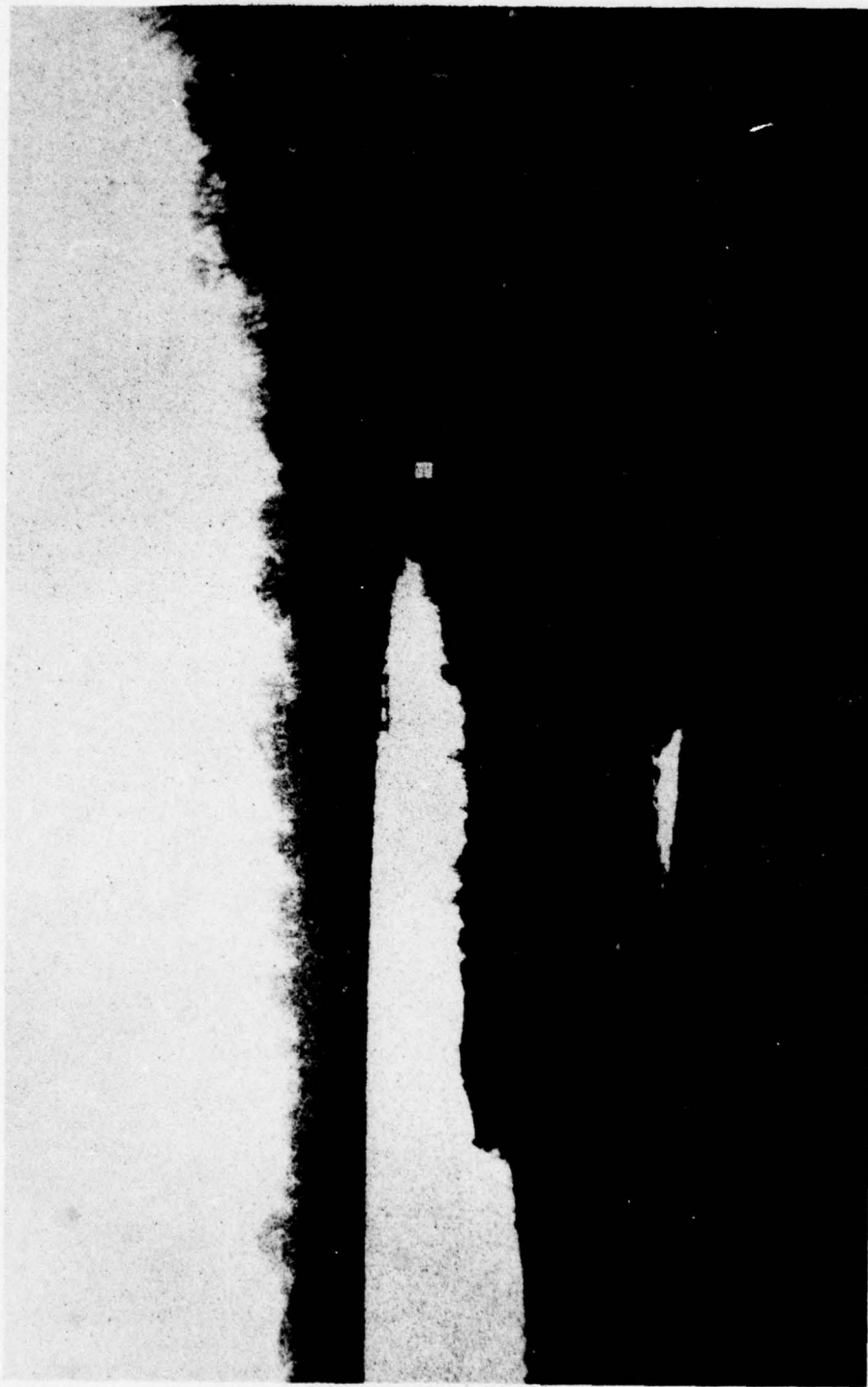
State Located New Jersey
County Located Mercer
Coordinates Lat. 4019.9 - Long. 7445.4
Stream Tributary (unnamed) to Stony Brook
Date of Inspection 8 December 1978

ASSESSMENT OF
GENERAL CONDITIONS

Stony Brook Dam No. 3 is in a good overall condition and has an adequate spillway capacity to accommodate the 100-year design flood. It is recommended that its hazard classification be downgraded to low as its overtopping or collapse would not increase the danger of loss of life or property damage. No detrimental findings were uncovered to merit further study. Recommended remedial actions to be undertaken in the future as part of the County Parks maintenance program include repair and seeding of the eroded areas of all slopes and the additional training of operating personnel relative to dam maintenance and inspection.


F. Keith Jolls P.E.
Project Manager





OVERVIEW OF STONY BROOK WATERSHED DAM SITE #3

DECEMBER, 1978

TABLE OF CONTENTS

| | <u>Page</u> |
|---|-------------|
| Assessment of General Conditions | |
| Overall View of Dam | |
| Table of Contents | |
| Preface | |
| Section 1 - Project Information | 1-5 |
| Section 2 - Engineering Data | 6-7 |
| Section 3 - Visual Inspection | 8-10 |
| Section 4 - Operational Procedures | 11-12 |
| Section 5 - Hydraulic/Hydrologic | 13-14 |
| Section 6 - Structural Stability | 15-16 |
| Section 7 - Assessment/Recommendations/ Remedial Actions | 17-18 |

FIGURES

| |
|--|
| Figure 1 - Regional Vicinity Map |
| Figure 2 - Typical Section at Spillway |
| Figure 3 - General Plan |
| Figure 4 - Concrete Riser Detail |

APPENDIX

| | |
|--|--------|
| Check List - Visual Inspection | |
| Check List - Engineering Data | |
| Photographs | |
| Check List - Hydrologic and Hydraulic Data | |
| Computations | A1-A15 |

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
NAME OF DAM: STONY BROOK NO. 3 FED# NJ 00389

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

This report is authorized by the Dam Inspection Act, Public Law 92-367, and has been prepared in accordance with contract FPM-36 between Louis Berger & Associates, Inc. and the State of New Jersey and its Department of Environmental Protection, Division of Water Resources. The State in turn, is under agreement with the U.S. Army Engineer District, Philadelphia, to have this inspection performed.

b. Purpose of Inspection

The purpose of this inspection is to evaluate the structural and hydraulic condition of the Stony Brook Watershed No. 3 and appurtenant structures, and to determine if the dam constitutes a hazard to human life or property.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

The dam at Stony Brook Watershed Site No. 3 (a.k.a. Johnstons Lake) is a two zone, 1,900 foot long, curvilinear earth structure with an impermeable core and cutoff key. The principal discharge outlet consists of a reinforced concrete drop inlet with an 18" RCP gate-operated low entrance inlet and a high stage weir. Discharge is through a 60" RCP which empties directly into the outlet channel. The top of the 5'x15' rectangular riser is open on all four sides and is capped with an anti-vortex slab 2 feet above the weir crest. A 100 foot wide

auxiliary spillway is located at the right abutment and has a negatively sloped entrance, a level control section, and a positively sloped outlet. A 6" perforated toe drain collector pipe extends across the downstream toe and discharges through the outlet headwall.

b. Location

Stony Brook Watershed Dam No. 3 is located in Hopewell Township, approximately two miles east of the center of the Borough of Pennington, Mercer County, New Jersey. The dam impounds an unnamed tributary of Stony Brook about 400 feet upstream of their confluence.

c. Size Classification

The maximum height of the dam is 28 feet and the maximum storage is estimated to be 463 acre-feet. Therefore, the dam is in the small size category as defined by the Recommended Guidelines for Safety Inspection of Dams (storage capacity less than 1,000 acre-feet).

d. Hazard Classification

No significant development lies downstream of the dam. The Rosedale Park playground facilities located at the dam site are situated near the left abutment where the failure potential is lowest. There are no downstream roads within several miles of the dam site and economic loss, except for the dam itself, would be minimal in the event of a failure. It is therefore recommended that this dam be classified in a low hazard category.

e. Ownership

The dam is owned by the Mercer County Park Commission, Mercer County Board of Chosen Freeholders, Trenton, New Jersey.

f. Purpose of Dam

The dual purpose of the dam is to provide flood/sediment retention on this tributary of Stony Brook and to enhance the recreational facilities for the surrounding County Park.

g. Design and Construction History

The dam was designed by the U.S. Soil Conservation Service and constructed in 1968-69. Detailed construction plans and design documents are available. It is unknown who actually accomplished the construction, but the dam appears to have been constructed in accordance with the design.

h. Normal Operating Procedures

The dam is maintained and operated as an integral part of Rosedale Park by personnel of the Mercer County Park Commission. See Section 4 for additional procedures.

1.3 PERTINENT DATA

a. Drainage Area

The drainage area is 1.5 square miles of rural, rolling countryside.

b. Discharge of Dam Site

Total spillway capacities at top of dam
elevation - 7,900 cfs

c. Elevation (ft. above M.S.L.)

Top of dam - 158.4
Principal spillway crest - 151.5
Auxiliary spillway crest - 153.8
Upstream invert 18" Ø diversion pipe - 134.0
Riser floor & invert of 60" Ø pipe - 133.0
Streambed at centerline of dam - 132₊

d. Reservoir

Length of maximum pool - 3,500 feet
Length of recreation pool - 3,100 feet

e. Storage (acre-feet)

Recreation pool (Principal spillway crest) - 182
Flood control pool (Auxiliary spillway crest) - 265
Top of dam - 463

f. Reservoir Surface (acres)

Top of dam - 56
Recreation pool - 30

g. Dam

Type - Earth with a drop inlet principal
spillway and an earth channel
auxiliary spillway

Length - 1,900 feet

Height - 28 feet

Top width - 15 feet

Side slopes - $2\frac{1}{2}$ H:1V

Zoning - Two zoned

Impervious core - Compacted fine-grained
material (95% max. density)

Cutoff - Variable depth, 10' wide impervious
cutoff key monolithic with core.

h. Diversion and Regulating Tunnel

None

i. Spillway

1) Principal Spillway

Type - Drop inlet with 60" diameter RCP
outlet (crest elevation - 151.5)

Gates - One 18" low level sluice gate
(Inv. elevation 134.0)

2) Auxilliary Spillway

Type - trapezoidal channel at right
abutment (crest elevation - 153.8)

Width of channel - 100 feet

U/S Channel - Negatively sloped, 380' long
grassed inlet.

D/S Channel - Positively sloped, 320'
long grassed outlet.

j. Regulating Outlets

Gate controlled, 18" Ø RC entry pipe (discharges
onto floor of drop inlet).

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

Complete details of the design plans, hydraulic determinations, and subsurface information were available at the Soil Conservation Service offices in Somerset. All design was done in accordance with SCS criteria and was discussed with their engineering personnel who explained the various design and operational features of the dam, particularly the hydraulic design parameters. Their geotechnical report concludes that the shale and silty gravel foundation materials present no stability problems and, according to their calculations, a factor of safety of 1.75 was concluded to be adequate. The closed conduit spillway geometry was determined by methods used in model studies at the St. Anthony's Falls Hydraulic Laboratory in Minneapolis. The concrete anti-vortex slab prevents the formation of a crotch and boil region (and the attendant reduction due to the entrance of air) in the inlet.

2.2 CONSTRUCTION

The construction appears to have closely followed the contract plans. There have been no major structural modifications.

2.3 OPERATION

As the principal purpose of the dam is to reduce urban flooding as well as to establish a recreational area, its operation appears to function properly under the aegis of the Park Commission.

2.4 EVALUATION

a. Availability

Sufficient engineering data was obtained to assess the structural stability with regard to the embankment zoning. The foundation stability was delineated in the various soils reports prepared by the SCS (which

analyzed all geotechnical aspects in considerable detail). The dam site lies in the Brunswick formation which consists of red silty shales and siltstone. The overburden ranges from 4' to 8' thick and consists of soft, silty, clayey alluvium, overlying roughly 2 feet of very firm, residual gravelly shale at the right abutment. The center section of the dam and left abutment are overlaid with 2 to 3 feet of alluvium over the compact gravel layers. The compacted core material was excavated from the right abutment area, while exposed bedrock at the left abutment was covered with a compacted soil layer to minimize seepage. The silty alluvium found at the site was utilized as embankment material, but the drain filter material was imported from off-site quarries.

b. Adequacy

The field inspection and review of the available design plans reveal that the dam is structurally sound and well-built. It is believed that the data available is adequate to render this assessment without recourse to gathering additional information.

c. Validity

The validity of the engineering data available is not challenged and is accepted without recourse to further investigations.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection was conducted on 8 December 1978. Weather conditions at the time of the inspection were overcast and cool. The overall appearance of the dam and appurtenant structures was satisfactory. Water level in the lake at the time of the inspection was at normal pool elevation 151.5 and the tailwater was at elevation 132.2. The region surrounding the site and immediately downstream is undeveloped, as is most of the upland drainage area.

b. Dam

In general, the dam appears to be in a stable condition. A substantial grass cover protects the slopes of the main embankment and the auxiliary spillway. The crest has vehicular tracks along its entire length despite the existence of a transverse wooden barrier. Deeper rutting was also noted on the approach section of the auxiliary spillway. The ruts were 4 to 5 inches deep and filled with water, which may be indicative of a high water table at this location. A seven foot long vertical surface crack was noted about halfway up the backslope of the embankment near the right end of the dam. The one inch wide by six inch deep crack exhibited some sloughing at the upslope end and appeared to have resulted from a combination of seepage, frost-action and surface erosion. Additional minor erosion was noted on the embankment near the left abutment. At this location the grass cover has been torn up by equestrians riding on the embankment slopes. In general, the observed percolation appears to be the result of a high natural water table and is not of a concentrated nature in any location. It is not a result of piping or seepage through the engineered embankment.

c. Appurtenant Structures

The concrete drop inlet and anti-vortex slab are located only a few feet offshore which permitted a close examination. While the 18" sluice gate stem wheel is missing, the remainder of the structure is in good condition. The concrete has a fresh appearance and no structural cracking was noted. Similarly, the outlet conduit and headwall are in satisfactory condition with only some minor efflorescence noted on the headwall. The right toe drain discharge pipe was dry, while the left drain was flowing freely. The grass-covered auxiliary spillway is approximately 100 feet wide and is in good condition with the exception of the previously described vehicle tracks. There is a pile of earth deposited near the right wall of the channel which apparently will be used for maintenance this spring.

d. Reservoir

The lake created by Stony Brook Dam No. 3 is part of the Mercer County Park system and is bounded on all sides by park property. The reservoir is surrounded by gently sloping, open to lightly wooded terrain and the shoreline is fairly well developed. The lake is clear of debris.

e. Downstream Channel

The area below the dam is undeveloped for as far as the next flood control structure which is located 1.5 miles downstream. The narrow discharge channel immediately below the dam has been excavated from the shale bedrock and has gently sloping banks which are devoid of vegetation for roughly 100 feet downstream. The area below the left abutment is developed into a small playground with an adjoining comfort station. A sanitary leaching field for a comfort station is presently being excavated about 185 feet downstream.

This excavation is about 5 feet deep. Upon its backfilling and completion, the inspection team felt this will have no effect upon the dam stability.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

Stony Brook Dam No. 3 is part of a 580 acre passive recreational area under the jurisdiction of the Mercer County Park Commission. As such, the dam is routinely maintained and patrolled by Park Department personnel. Maintenance is generally limited to grounds keeping. There are no documented operational procedures which apply to the dam gate or sstructure.

4.2 MAINTENANCE OF DAM

Maintenance personnel of the Park Commission are on duty in the area on a daily basis. Routine maintenance of the dam includes mowing, debris removal and minor repairs when required. This includes removal of debris in or around the drop inlet and discharge channel as well as repair of eroded surfaces.

4.3 MAINTENANCE OF OPERATING FACILITIES

The only regulating feature at this dam is the gate-controlled, low level, 18" emergency drain pipe. The gate has never been opened and there are no operating instructions available. In addition, the stem wheel is presently stored at the office of the utility engineer (some 5 miles from the dam). The dam is formally inspected once a year by personnel of the Soil Conservation Service and Park Commission. Minor remedial action prescribed by the inspection team is performed by the MCPC maintenance crews while major repairs, when required, are referred to the SCS.

4.4 DESCRIPTION OF ANY WARNING SYSTEM IN EFFECT

There is no warning system in effect although MCPC personnel monitor the dam during heavy storms.

4.5 EVALUATION OF OPERATIONAL ADEQUACY

While the purpose and function of this dam requires little in the way of operational procedures, it is felt that some additional training of park maintenance and patrol personnel could improve the operational efficiency and safety of the dam. The stem wheel should be stored at the dam site and maintenance personnel and park police should be instructed in visual indications of dam deterioration and steps to remedy specific defects.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES

a. Design Data

Based on the criteria in the Recommended Guidelines for Safety Inspection of Dams, the 100-year frequency event was selected as the design storm by the inspecting engineer. Precipitation data was obtained from Technical Paper 40 and NOAA Tech. Memo NWS - Hydro #35. Storage data and time of concentration were obtained from the Soil Conservation Service design calculations and reviewed in the context of current inspection criteria. Inflow to the reservoir for the selected 100-year storm was computed utilizing the HEC-1 computer program which yielded a peak inflow of 2,152 cfs. Routing this through the controlled-release reservoir reduced the discharge to 1,563 cfs. The combined spillways have a maximum discharge capacity of approximately 7,900 cfs before overtopping occurs and can therefore accommodate the design flood. The depth of crest flow in the auxiliary spillway is less than 1.5 feet for this design discharge.

b. Experience Data

The dam was originally designed for a 100-year frequency storm using a time of concentration of 1.5 hours. The auxiliary spillway height was established so that the design flow depth (according to SCS procedures), leaves slightly more than 2 feet of freeboard to the dam crest. In the original design, the detailed hydraulic analyses (including infiltration studies), were exhaustively performed by the SCS to quantify final design values against the economical apportionment of the dam.

c. Visual Observations

With the water at normal pool elevation at the time of inspection, approximately 2 cfs was flowing out of the 60" outfall. According

to park personnel, no flow has ever been transmitted over the auxiliary spillway. Visual observations confirmed all the aspects and assumptions of the original hydraulic design.

d. Overtopping Potential

There are no records of the dam having been overtopped and the main and auxiliary spillways can easily accommodate the design flood.

e. Drawdown Potential

Drawdown capability is provided by the 18" operable sluice gate. Assuming no tailwater, it would take approximately 3 days to dewater the lake from normal pool elevation.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

In view of the relative age of the dam embankment, the well-designed and supervised construction, and the continuous maintenance, the dam at Stony Brook Site No. 3 is deemed to be in a good to excellent condition. The main embankment crest and adjoining cut slopes along the auxiliary spillway are at true design grade. The toe drain left of the spillway outfall appears to be under a continuous but modest head due to seepage and/or percolation. In summary, nothing was visually noted to create or worsen present conditions that cannot be readily maintained or corrected.

b. Design and Construction Data

From the review of the SCS soils report, hydraulic recommendations and contract plans for the initial construction, the design appears to be well-engineered, reflects a conservative approach and employs conventional analytical techniques. In view of the condition of the dam and hazard classification, it is believed that additional studies are unnecessary under the purview of PL 92-367.

c. Operating Records

The performance of this structure has been satisfactory since its completion. However there are no formal operating records available.

d. Post Construction Changes

There have been no major modifications since the initial construction that affect the overall structural integrity of the dam.

e. Seismic Stability

The dam is located in Zone 1 and has negligible potential vulnerability to seismic loadings.

Dams in this zone which have an adequate factor of safety under static loading conditions will also prove stable under dynamic loading conditions.

SECTION 7 - ASSESSMENTS/RECOMMENDATIONS/
REMEDIAL ACTIONS

7.1 DAM ASSESSMENT

a. Safety

Subject to the inherent limitations of the Phase I visual inspection, Stony Brook Dam No. 3 is judged to be in a good to excellent overall structural condition. Overtopping of the dam is a very remote possibility and no seriously detrimental conditions were observed. The dam is recommended to be placed in a low hazard category due to location within the officially designated Mercer County Parklands. The combined spillway capacities considerably exceeds the selected 100-year frequency design flood.

b. Adequacy of Information

The information made available by the Soil Conservation Service is deemed to be adequate regarding the analyses and evaluation of safe operation and structural stability.

c. Urgency

No urgency is attached to implementing the remedial measures set forth below.

d. Necessity for Further Study

In view of the overall condition of this dam and the fact that it is continually monitored by trained personnel, additional inspections under the purview of P.L. 92-367 are deemed to be unnecessary. The County Parks Department in conjunction with SCS engineers, maintain a system of annual inspections which basically reflect the requirements mandated under P.L. 92-367.

7.2 RECOMMENDATIONS/REMEDIAL MEASURES

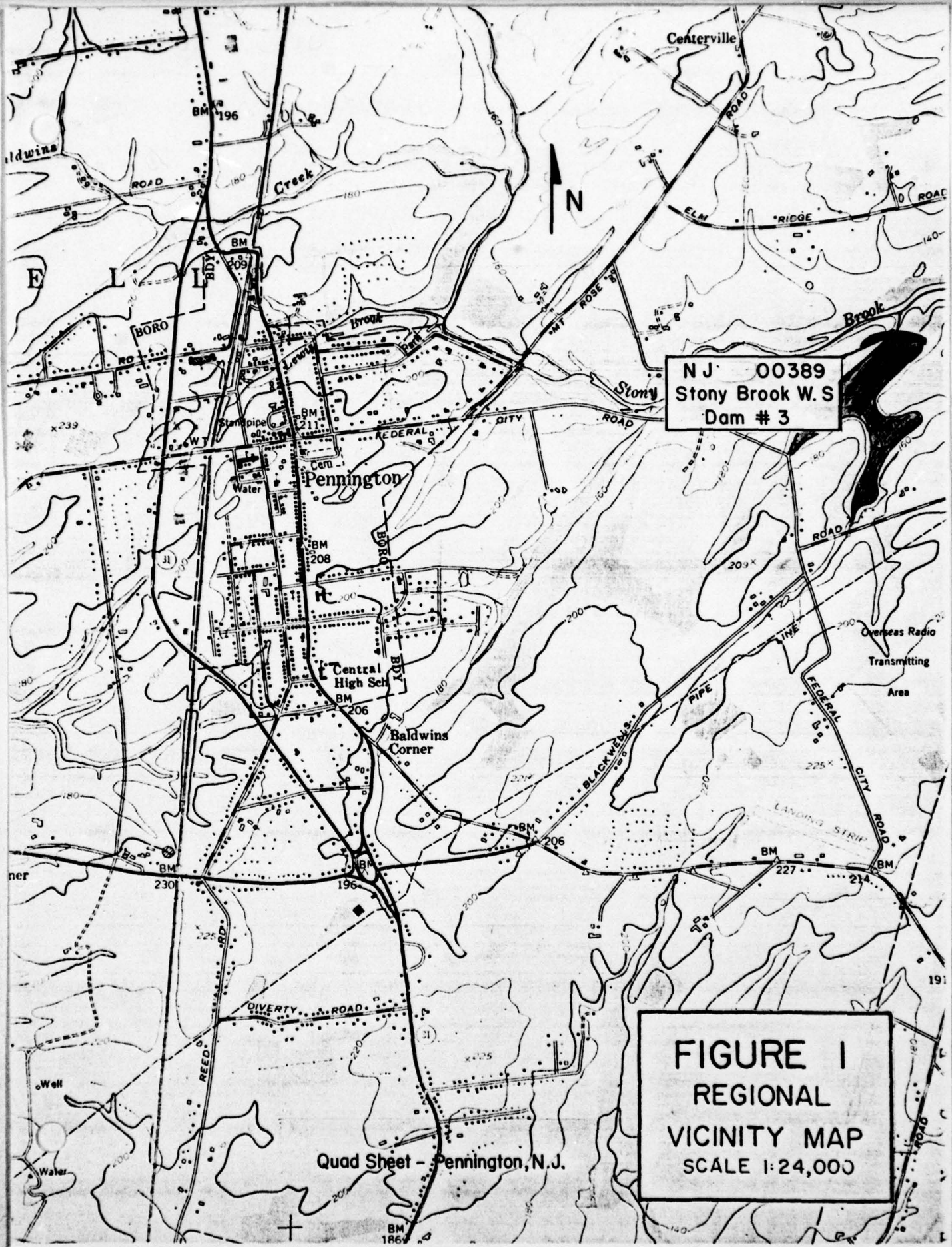
a. Recommendations

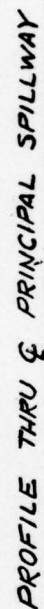
Under the present maintenance program, it is recommended that the following be taken under advisement in the future:

- Regrade the eroded backslopes and sides and reseed the barren areas.
- Continue to monitor the backslope seepage and the subgrade drains.

b. O&M Maintenance and Procedures

In view of the assessment contained herein, no additional procedures other than those presently in effect appear to be required. However, it is recommended that additional training be considered for park personnel relative to maintenance and inspection.





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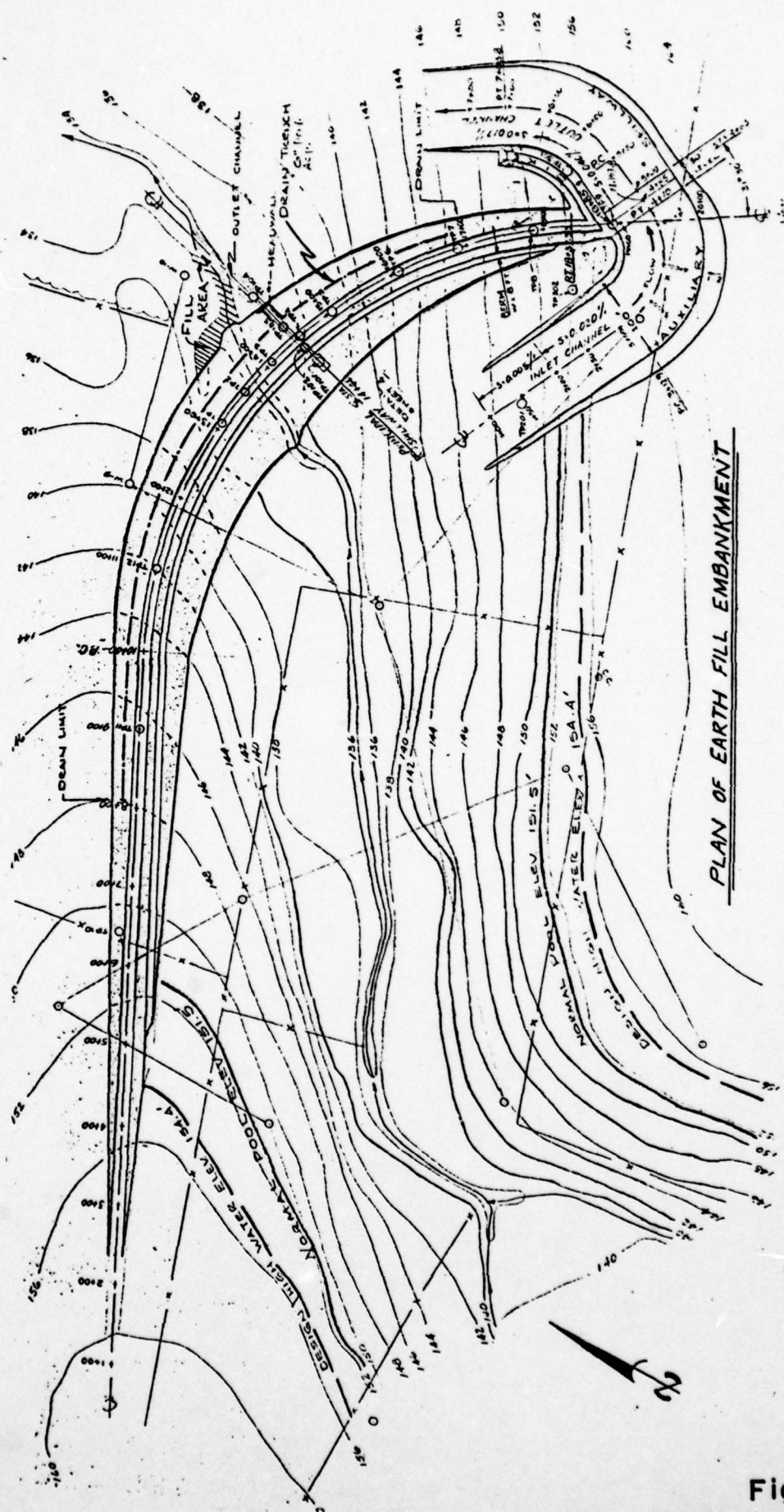


Figure 3

Check List
Visual Inspection
Phase 1

Name Dam Stony Brook W.S.No.3 County Mercer State New Jersey Coordinators NJDEP

Date(s) Inspection 12/8/78 Weather Cloudy Temperature 45°

Pool Elevation at Time of Inspection 151.5 M.S.L. Tailwater at Time of Inspection 132± M.S.L.

Inspection Personnel:

T. Chapter

K. Jolls

C. Chhut

E. Simone

C. Chhut Recorder

Dam No. 00389

EMBANKMENT

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|--|---|--|
| SURFACE CRACKS | Shallow vertical cracks on right embankment. | Cracks appear to be the result of frost action and surface erosion rather than a structural deficiency. (See photo). |
| UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE | None observed. | |
| SLOUGHING OR EROSION OF EMBANKMENT AND ADJUTENT SLOPES | Tire ruts on crest of dam. Minor erosion at headwall of outlet. Hoof prints on and around embankment. | Barrier across crest. Tire tracks on slope of embankment at location of barrier. |
| VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST | Satisfactory alignment. No signs of differential settlement noted. | |
| RIPRAP FAILURES | N/A | |

EMBANKMENT

VISUAL EXAMINATION OF

OBSERVATIONS

REMARKS OR RECOMMENDATIONS

An excavation for septic system at recreational facilities was opened 185 feet below the left embankment.

Excavation filled with ground water probably coming from lake. Excavation should be backfilled and septic system relocated. (See photo).

JUNCTION OF EMBANKMENT
AND ABUTMENT, SPILLWAY
AND DAM

Left embankment grades into natural terrain. Right embankment abuts the auxiliary spillway. Both satisfactory.

ANY NOTICEABLE SEEPAGE

Light seepage along toe of central portion of embankment and over the headwall of the outlet structure.

Flows are widely dispersed and none are concentrated. (See photo).

STAFF GAGE AND RECORDER

None

DRAINS

2-6" ϕ toe drains - one on each side of the outlet pipe in good condition.

Left drain flowing freely. No discharge from right drain. (See photo).

OUTLET WORKS

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|--|--|----------------------------|
| CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT | Outlet conduit and headwall in new condition. No deterioration noted. | See photo |
| INTAKE STRUCTURE | Concrete in new condition. No deterioration noted. Wheel for gate steam missing. | See photo |
| OUTLET STRUCTURE | No deterioration noted. | See photo |
| OUTLET CHANNEL | Narrow, shallow sloping sides are defoliated for 100' below outlet. | See photo |
| EMERGENCY GATE | At elevation 134 M.S.L. of intake structure. Not visible to inspection team. | |

UNGATED SPILLWAY

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-----------------------|--|----------------------------|
| CONCRETE WEIR | <p><u>Principal spillway:</u> 60" ϕ drop inlet pipe in good condition.</p> <p><u>Auxiliary spillway:</u> Good condition.</p> | |
| APPROACH CHANNEL | <p><u>Principal spillway:</u> None</p> <p><u>Auxiliary spillway:</u> Good condition. 300' of grass covered entrance channel.</p> | |
| DISCHARGE CHANNEL | <p><u>Principal spillway:</u> Good.</p> <p><u>Auxiliary spillway:</u> Good. 350' of outlet channel, thickly grassed.</p> | |
| BRIDGE AND PIERS | None | |

GATED SPILLWAY

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-------------------------------|---|--|
| CONCRETE SILL | N/A | |
| APPROACH CHANNEL | N/A | |
| DISCHARGE CHANNEL | N/A | |
| BRIDGE AND PIERS | N/A | |
| GATES AND OPERATION EQUIPMENT | Control wheel for gate stem is missing. | Believed to be stored at office of utility engineer at Mercer County Airport - approximately 5 miles away. |

INSTRUMENTATION

REMARKS OR RECOMMENDATIONS

VISUAL EXAMINATION

MONUMENTATION/SURVEYS

OBSERVATIONS

Square cut bench mark at downstream end of Federal City Road Bridge. TBM in power pole at bend in Farm Lane.

OBSERVATION WELLS

None

WEIRS

"V"-notch weir in one section of drop inlet, but not utilized for flow determination.

PIEZOMETERS

None

OTHER

None

RESERVOIR

REMARKS OR RECOMMENDATIONS

VISUAL EXAMINATION OF

OBSERVATIONS

SLOPES

Gently sloping on all sides. Light
treed to southwest. Heavier foliage
to east and southeast.

SEDIMENTATION

None

Desiltation is one of the dam's
primary functions.

DOWNSTREAM CHANNEL

REMARKS OR RECOMMENDATIONS

OBSERVATIONS

VISUAL EXAMINATION OF

Channel clear of debris.

Principal spillway: Good although denuded of vegetation.

Auxiliary spillway: Outlet channel in good condition - damp surface.

SLOPES

Principal spillway: 1.5H: IV side slopes cut into outcropping shale.

Auxiliary spillway: 3H: IV side slopes in good condition.

APPROXIMATE NO. OF HOMES AND POPULATION

No downstream construction or developments.

Construction of playground underway near dam.

Ground at construction site approx. El. 150+.

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

| ITEM | REMARKS |
|---------------------------|--|
| PLAN OF DAM | Available from U.S. Department of Agriculture Soil Conservation Service 1370 Hamilton Street, Somerset. |
| REGIONAL VICINITY MAP | Available |
| CONSTRUCTION HISTORY | Available from Soil Conservation Service |
| TYPICAL SECTIONS OF DAM | Available from Soil Conservation Service |
| HYDROLOGIC/HYDRAULIC DATA | Available from Soil Conservation Service |
| OUTLETS - PLAN | Available from Soil Conservation Service |
| - DETAILS | Available from Soil Conservation Service |
| - CONSTRAINTS | Available from Soil Conservation Service |
| - DISCHARGE RATINGS | Available from Soil Conservation Service |
| RATINGS/RESERVOIR RECORDS | Not Kept |

| ITEM | REMARKS |
|------|---------|
|------|---------|

| | |
|----------------|---|
| DESIGN REPORTS | Available from Soil Conservation Service. |
|----------------|---|

| | |
|-----------------|--|
| GEOLOGY REPORTS | Available from Soil Conservation Service |
|-----------------|--|

| | |
|---|--|
| DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES | Available from Soil Conservation Service Available from Soil Conservation Service Available from Soil Conservation Service Available from Soil Conservation Service |
|---|--|

| | |
|---|--|
| MATERIALS INVESTIGATIONS BORROW RECORDS LABORATORY FIELD | Available from Soil Conservation Service Available from Soil Conservation Service Available from Soil Conservation Service Available from Soil Conservation Service |
|---|--|

| | |
|----------------------------------|----------------|
| POST-CONSTRUCTION SURVEYS OF DAM | None performed |
|----------------------------------|----------------|

| | |
|-----------------|--|
| BORROW SOURCES. | Available from Soil Conservation Service |
|-----------------|--|

ITEM _____ REMARKS _____

MONITORING SYSTEMS

None

MODIFICATIONS

None

HIGH POOL RECORDS

None kept

POST CONSTRUCTION ENGINEERING
STUDIES AND REPORTS

None performed with exception of annual inspection reports
which are available from SCS.

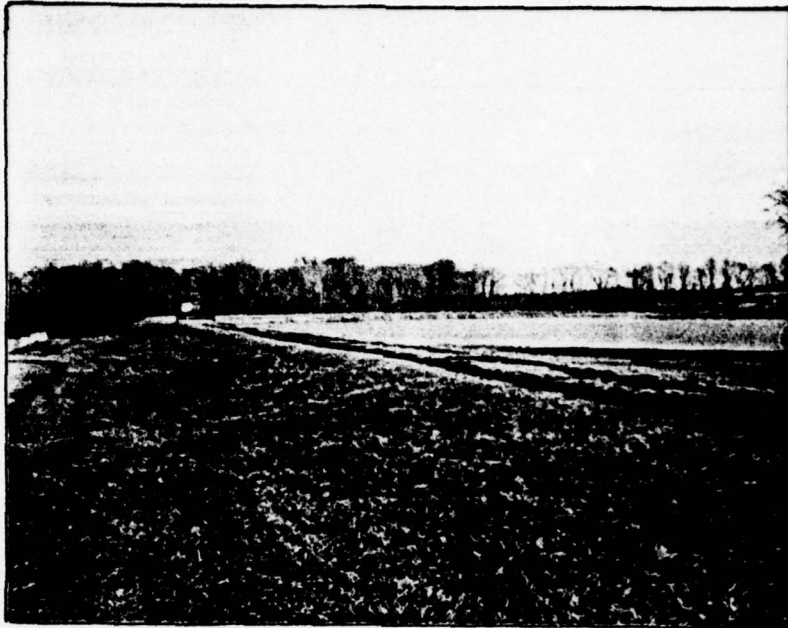
PRIOR ACCIDENTS OR FAILURE OF DAM
DESCRIPTION
REPORTS

None

MAINTENANCE
OPERATION
RECORDS

None kept

| ITEM | REMARKS |
|--|---|
| SPILLWAY PLAN | Available from U.S. Department of Agriculture Soil Conservation Service |
| SECTIONS | Available from Soil Conservation Service |
| DETAILS | Available from Soil Conservation Service |
| OPERATING EQUIPMENT PLANS & DETAILS | Available from Soil Conservation Service |



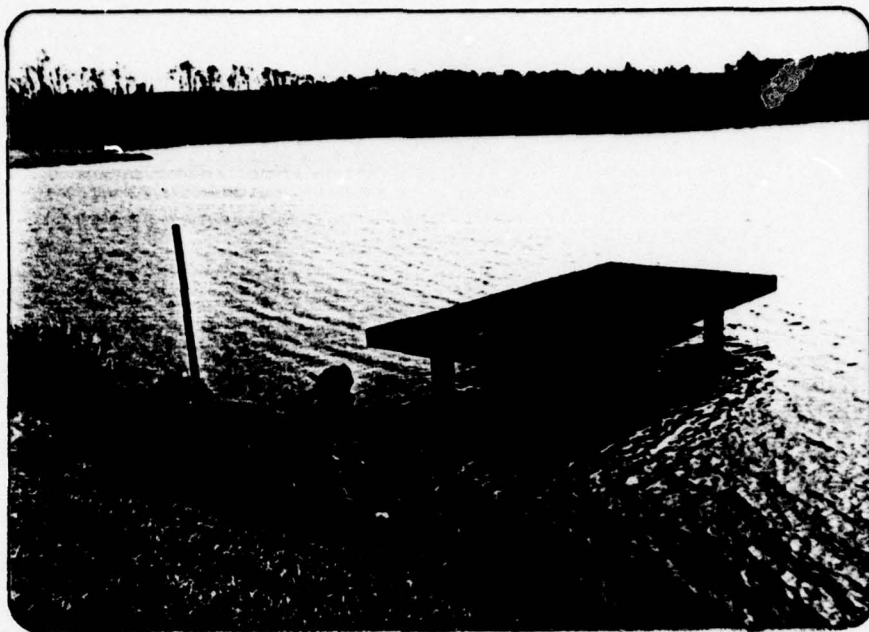
December, 1978

Looking East



December, 1978

View downstream



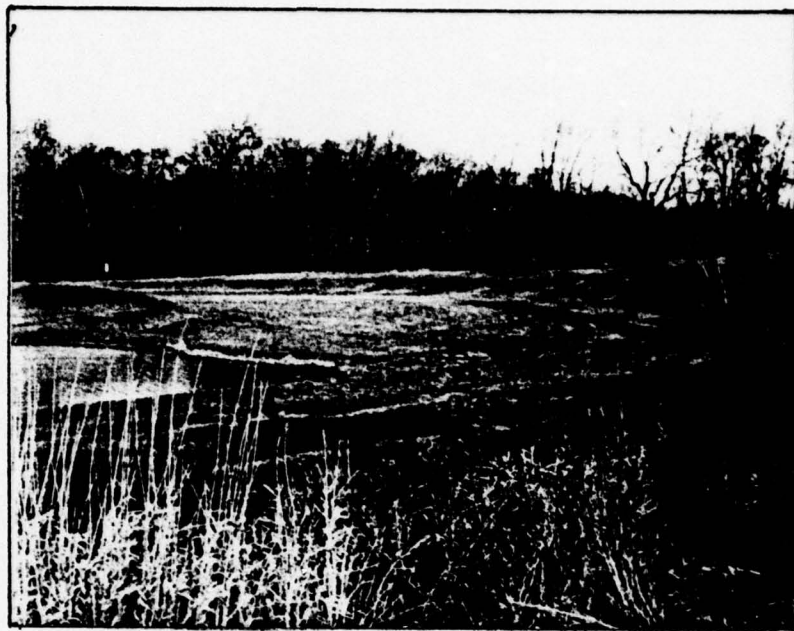
December, 1978

View of intake structure



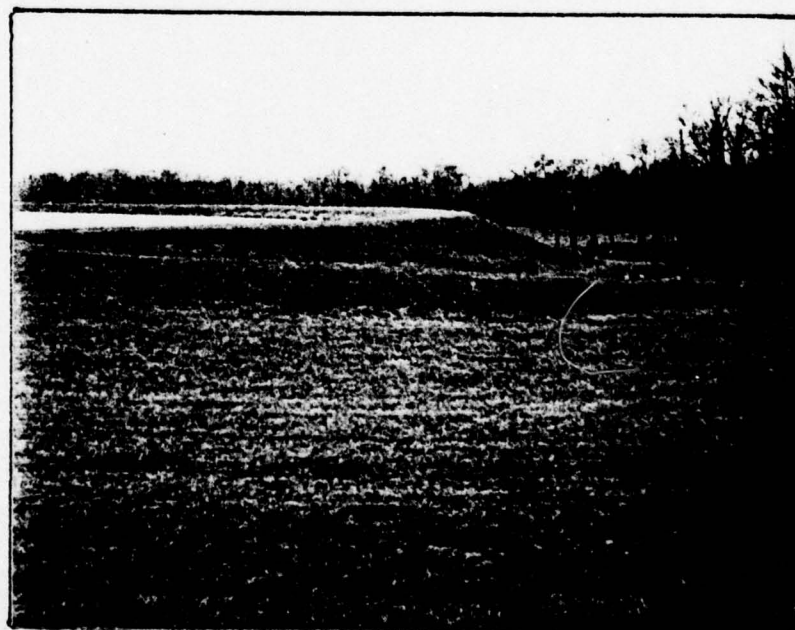
December, 1978

View of outlet structure



December, 1978

View of auxiliary spillway



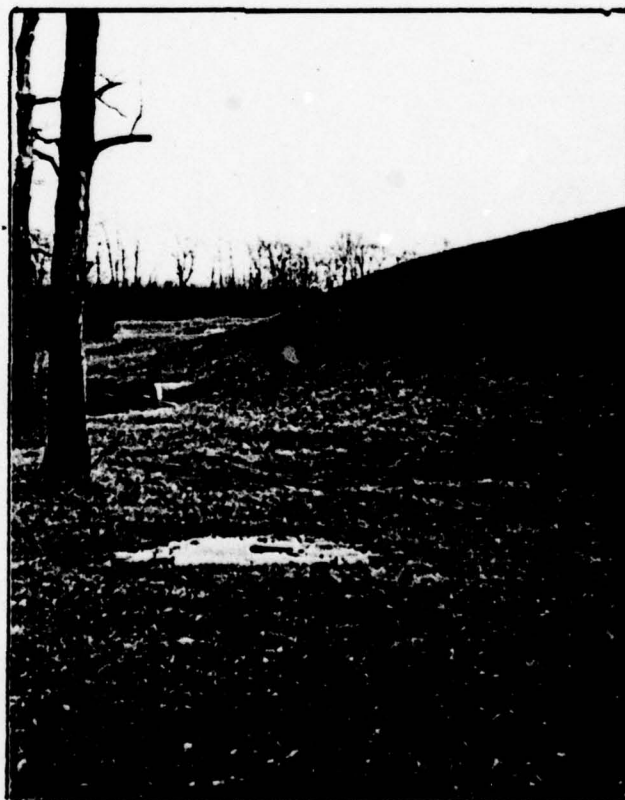
December, 1978

View of auxiliary spillway



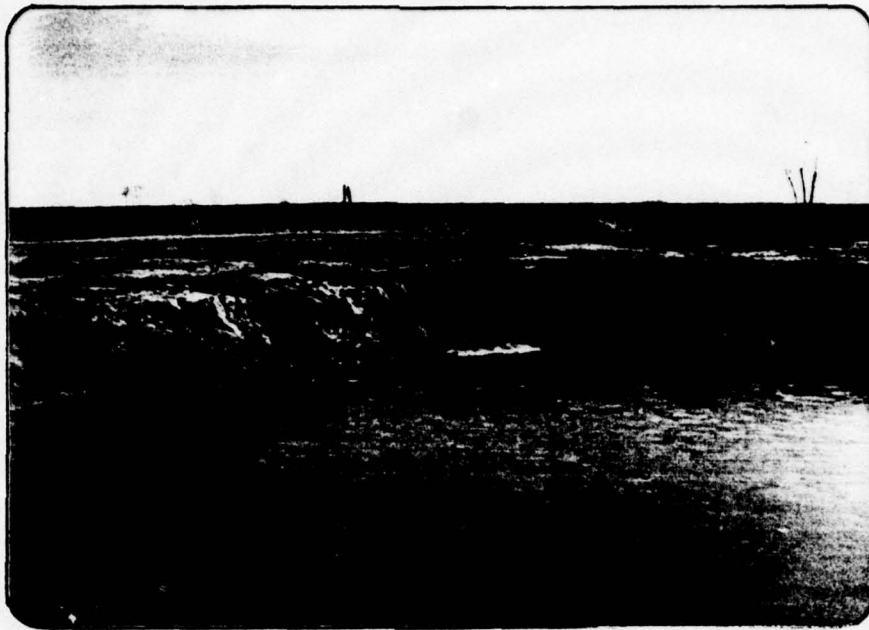
December, 1978

Seepage at toe



December, 1978

Seepage at toe of left embankment



December, 1978

View towards dam

SITE OF PROPOSED LEACHING FIELD



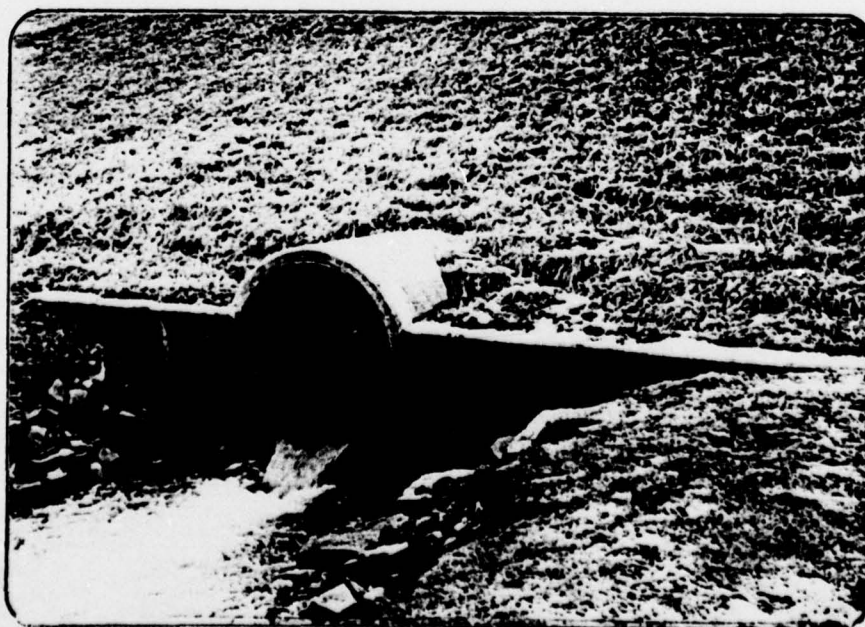
December, 1978

View downstream



December, 1978

Vertical surface cracks



December, 1978

Toe drains and seepage at outlet structure

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATADRAINAGE AREA CHARACTERISTICS: 1.5 sq.mi.ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): Elev. 151.5 (182 acre-feet)ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 153.8 (265 acre-feet)ELEVATION MAXIMUM DESIGN POOL: Elev. 154.4ELEVATION TOP DAM: Elev. 158.4

CREST:

- a. Elevation 153.8 M.S.L. (Auxiliary spillway crest)
- b. Type Vegetated auxiliary spillway channel
- c. Width 100 feet
- d. Length 380' entrance; 30' control section; 320' outlet
- e. Location Spillover Right abutment
- f. Number and Type of Gates None

OUTLET WORKS:

- a. Type 2 stage drop inlet with 60" ϕ R.C. discharge pipe
- b. Location Station 14+44
- c. Entrance inverts Weir at 151.5 M.S.L.; 60" ϕ at 133.0 M.S.L.
- d. Exit inverts 130.5 M.S.L.
- e. Emergency draindown facilities 18" ϕ R.C.P. at elevation 134.0 M.S.L.

HYDROMETEOROLOGICAL GAGES: None

- a. Type
- b. Location
- c. Records

MAXIMUM NON-DAMAGING DISCHARGE: 7900 cfs

BY D.J.M. DATE 2-79

LOUIS BERGER & ASSOCIATES INC.

SHEET NO. A1 OF

CHKD. BY _____ DATE _____

STONY BROOK W.S. 3 DAM INSPECTION

PROJECT C227

SUBJECT _____

Time of concentration as computed by S.C.S.

| Time of concentration - - T_c | | | | |
|---|----------------------------------|--|--|----------------------------------|
| (1) Description of course of runoff water | (2) Slope of course (%) | (3) Length (l) of course (ft) | (4) Velocity of runoff water (v) (ft/sec) | (5) time (sec) = (3) ÷ (4) |
| REACH I - overland | < 3 | 2200 | 0.8 | 2750 |
| REACH II - channel | 0.5 | 1400 | 1.8 | 778 |
| REACH III - channel | 0.5 | 1300 | 1.7 | 765 |
| REACH IV - channel | 0.5 | 1900 | 2.4 | 792 |
| REACH V - channel | 1.2 | 1400 | 2.6 | 538 |
| Sum | | | | 5623 |

$$T_c = \sum \frac{1}{v \times 3600} = 1.56 \text{ hours} \quad \text{Use } 1.5 \text{ hours}$$

Use 0.25 hr interval

$$\therefore T_p = \frac{0.25}{2} + 0.6 T_c = 1.03 \text{ hrs.}$$

Drainage area = 1.5 sq miles

$$\therefore Q_p = \frac{484 \times 1.5 \times 1}{1.03}$$

$$= 708 \text{ cfs}$$

BY D. J. M. DATE 2-79

CHKD. BY _____ DATE _____

SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

STONY BROOK W.S. 3 DAM INSPECTION

SHEET NO. A2 OF _____PROJECT C 227

| <u>T</u> <u>hrs</u> | <u>T/T_p</u> | <u>Dimensionless Ordinate</u> <u>(D₀) = Q / Q_p</u> | <u>Q</u> <u>= D₀ × Q_p</u> |
|------------------------|------------------------|---|--|
| 0.25 | 0.24 | 0.10 | 71 |
| 0.50 | 0.49 | 0.41 | 290 |
| 0.75 | 0.73 | 0.81 | 573 |
| 1.00 | 0.97 | 0.99 | 701 |
| 1.25 | 1.21 | 0.91 | 644 |
| 1.50 | 1.46 | 0.69 | 489 |
| 1.75 | 1.70 | 0.49 | 347 |
| 2.00 | 1.94 | 0.35 | 248 |
| 2.25 | 2.18 | 0.24 | 170 |
| 2.50 | 2.43 | 0.17 | 120 |
| 2.75 | 2.67 | 0.11 | 78 |
| 3.00 | 2.91 | 0.08 | 57 |
| 3.25 | 3.16 | 0.06 | 42 |
| 3.50 | 3.40 | 0.043 | 30 |
| 3.75 | 3.64 | 0.031 | 22 |
| 4.00 | 3.88 | 0.018 | 13 |
| 4.25 | 4.13 | 0.015 | 11 |
| 4.50 | 4.37 | 0.011 | 8 |
| | | | <u>Σ 3914</u> |

Check unitgraph

$$\frac{3914 \times 12 \times 3600}{4 \times 1.5 \times 5280^2} = 1.0108 \approx 1 \text{ inch over the area so } \underline{\text{O.K.}}$$

BY D.J.M. DATE 1-79
CHKD. BY _____ DATE _____
SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

STONEY BROOK #3

SHEET NO. A3 OF _____
PROJECT C227

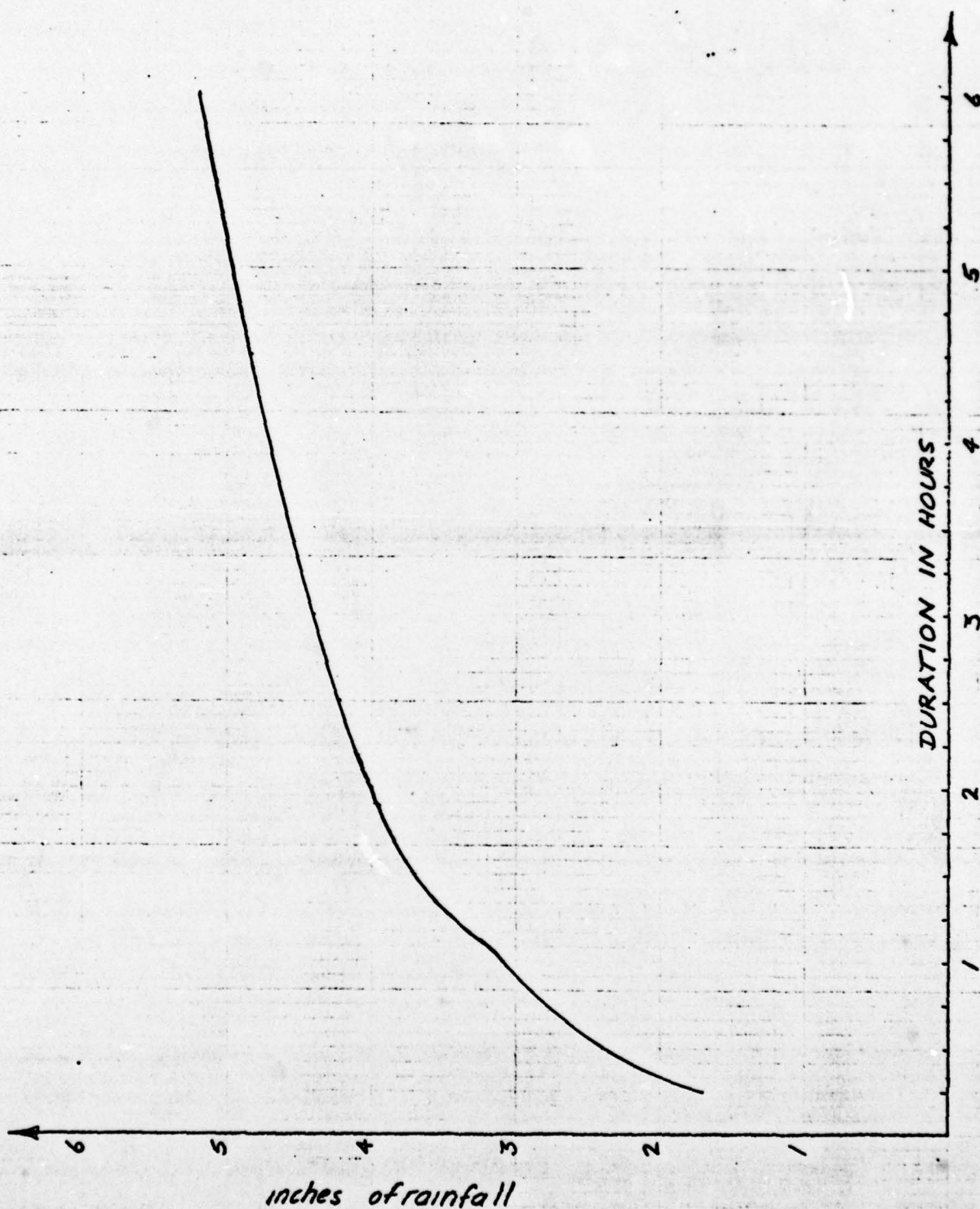
PRECIPITATION DATA FROM T.P. 40 (see depth duration curve overleaf)
& NOAA Technical memorandum NWS HYDRO-35

| Time | Precipitation | Δ | Rearrange Δ |
|------|---------------|----------|--------------------|
| 0.25 | 1.7 | 1.7 | 0.06 |
| 0.50 | 2.4 | 0.7 | 0.06 |
| 0.75 | 2.8 | 0.4 | 0.06 |
| 1.00 | 3.1 | 0.3 | 0.06 |
| 1.25 | 3.5 | 0.4 | 0.07 |
| 1.50 | 3.7 | 0.2 | 0.07 |
| 1.75 | 3.86 | 0.16 | 0.08 |
| 2.00 | 4.00 | 0.14 | 0.09 |
| 2.25 | 4.11 | 0.11 | 0.09 |
| 2.50 | 4.22 | 0.11 | 0.09 |
| 2.75 | 4.31 | 0.09 | 0.11 |
| 3.00 | 4.40 | 0.09 | 0.11 |
| 3.25 | 4.49 | 0.09 | 0.30 |
| 3.50 | 4.57 | 0.08 | 0.70 |
| 3.75 | 4.64 | 0.07 | 1.70 |
| 4.00 | 4.71 | 0.07 | 0.40 |
| 4.25 | 4.78 | 0.07 | 0.40 |
| 4.50 | 4.84 | 0.06 | 0.20 |
| 4.75 | 4.90 | 0.06 | 0.16 |
| 5.00 | 4.96 | 0.06 | 0.14 |
| 5.25 | 5.02 | 0.06 | 0.07 |
| 5.50 | 5.08 | 0.06 | 0.06 |
| 5.75 | 5.14 | 0.06 | 0.06 |
| 6.00 | 5.20 | 0.06 | 0.06 |

BY D. J. M. DATE 1-79
CHKD. BY _____ DATE _____

SUBJECT T.P. 40 & NWS HYDRO-35
DEPTH DURATION CURVE
STONY BROOK W.C. 3 DAM INSPECTION

SHEET NO. A4 OF _____
JOB NO. C227



BY D.J.M. DATE 2-79
 CHKD. BY _____ DATE _____
 SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

STONY BROOK W.S. 3 DAM INSPECTION

SHEET NO. A5 OF
 PROJECT C227

Spillway Discharge Calculations (not from SCS)

| flow over riser Weir flow $L = 38'$ | | | culvert flow $c = 0.55 \quad a = 76$ | | Through 60" pipe | | Auxiliary Spillway | |
|---|-----|-----|---|-----|------------------|-----|-----------------------|-------|
| H | C | Q | H | Q | H | Q | H | Q |
| 1 | 3.1 | 118 | | | 16.5 | 471 | | |
| 2 | 3.1 | 333 | | | 17.5 | 485 | | |
| | | | 3 | 581 | 18.5 | 499 | 0.7 | 325 |
| | | | 4 | 670 | 19.5 | 512 | 1.7 | 1408 |
| | | | 5 | 750 | 20.5 | 525 | 2.7 | 3005 |
| | | | 6 | 821 | 21.5 | 538 | 3.7 | 5017 |
| | | | 7 | 887 | 22.5 | 550 | 4.7 | 7383 |
| | | | 8 | 948 | 23.5 | 562 | 5.7 | 10060 |

| Over Dam $L = 1800$ | | | ΣQ | | flow through auxiliary spillway using mannings formula $n = 0.05$ assume rectangular channel 100' wide |
|------------------------|-----|------|------------|--------|--|
| H | C | Q | H | Q | |
| | | | 1 | 118 | |
| | | | 2 | 333 | |
| | | | 3 | 824 | |
| | | | 4 | 1,920 | |
| | | | 5 | 3,530 | |
| | | | 6 | 5,555 | |
| 0.1 | 2.7 | 154 | 7 | 8,087 | |
| 1.1 | 2.7 | 5607 | 8 | 16,229 | |

for flow through 60" pipe tailwater Elev. of +136 assumed
 formula used:

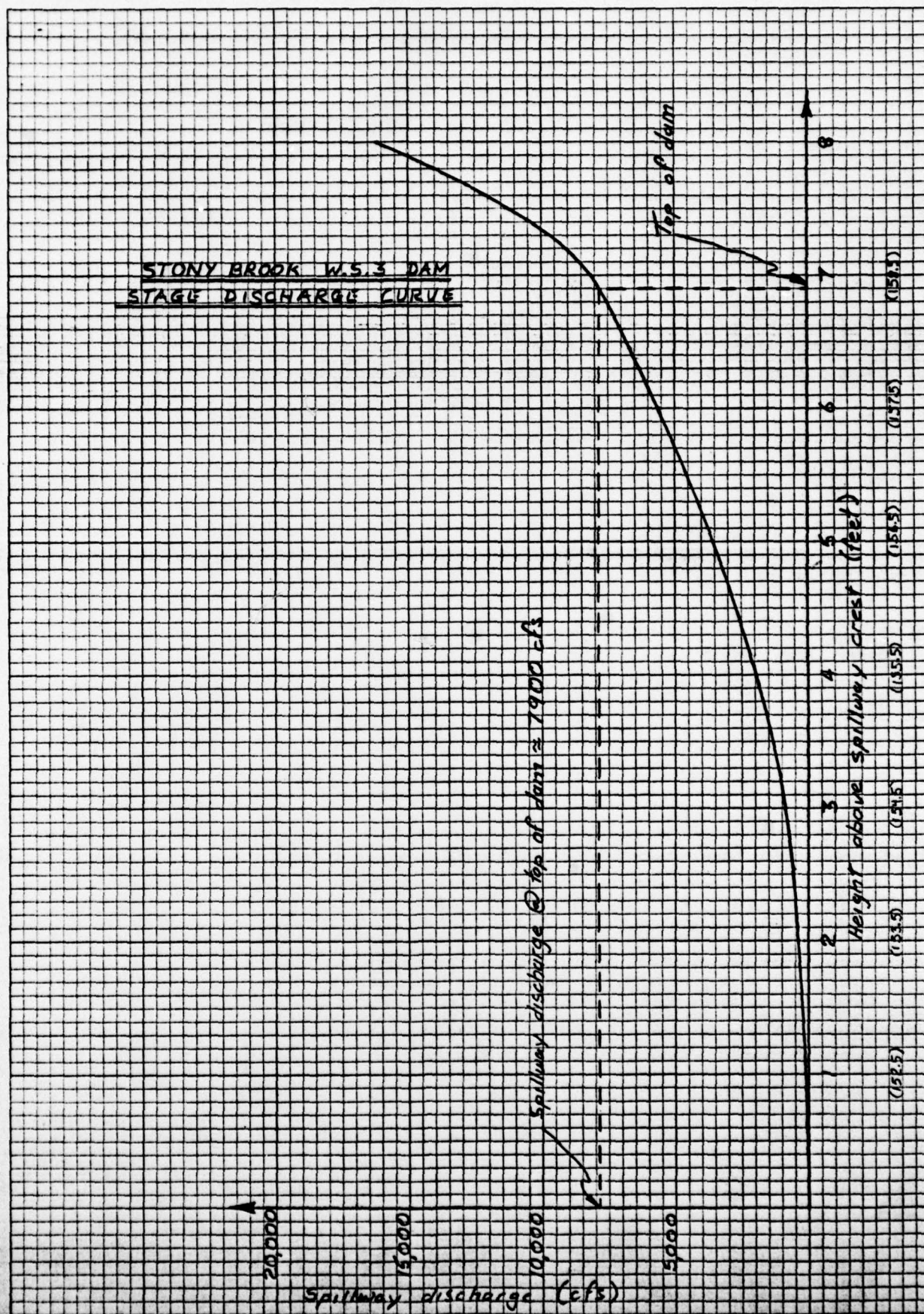
$$Q^2 = \frac{100 \times H}{\left[\frac{2.5204(1+K_e)}{D^4} + \frac{466.18n^2 L}{D^{16/3}} \right]}$$

$n = 0.012$

$K_e = 0.5$

$L = 110'$

46 0706

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

BY D.J.M. DATE 2-79

LOUIS BERGER & ASSOCIATES INC.

SHEET NO. A7 OF

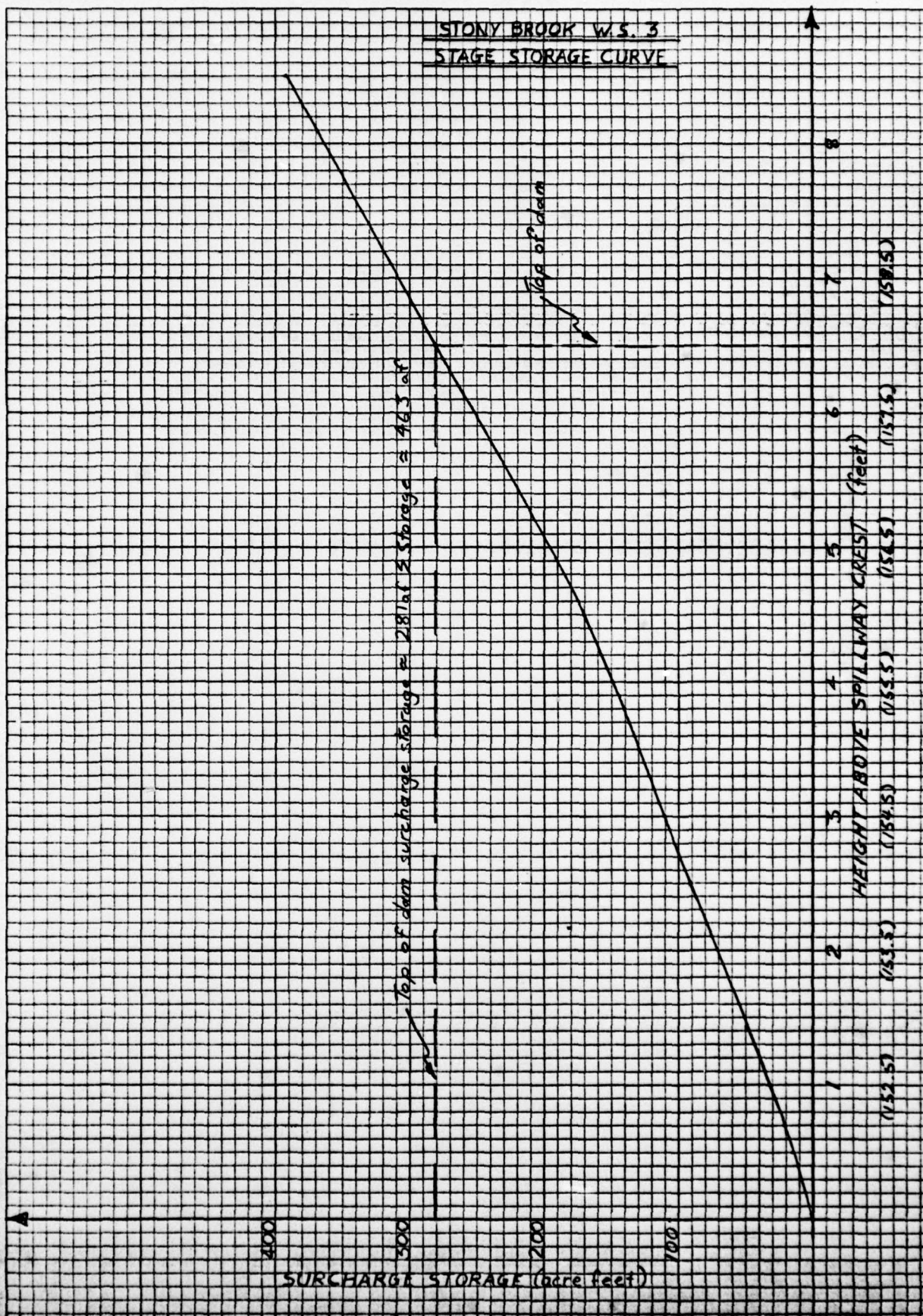
CHKD. BY _____ DATE _____

STONY BROOK W.S. 3 DAM INSPECTIONPROJECT C 227

SUBJECT _____

Stage storage data as calculated by Soil Conservation Service

| <u>Elevation</u> <u>(feet)</u> | <u>Storage</u> <u>(acre feet)</u> | <u>Surcharge Storage</u> <u>(acre feet)</u> |
|-----------------------------------|--------------------------------------|--|
| 151.5 | 182 | 0 |
| 152.0 | 197 | 15 |
| 154.0 | 274 | 92 |
| 156.0 | 352 | 170 |
| 158.0 | 463 | 281 |
| 160.0 | 574 | 392 |



BY D.J.M. DATE 2-79
CHKD. BY _____ DATE _____
SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

STONY BROOK W.S. 3 DAM INSPECTION

SHEET NO. A9 OF _____
PROJECT C227

Summary of storage - discharge data for HEC-1 computer program

| HEIGHT ABOVE SPILLWAY CREST (feet) | SURCHARGE STORAGE (acre feet) | SPILLWAY DISCHARGE (cfs) |
|--|----------------------------------|-----------------------------|
| | 0 | 0 |
| 1 | 32 | 118 |
| 2 | 70 | 333 |
| 3 | 110 | 824 |
| 4 | 150 | 1,920 |
| 5 | 196 | 3,530 |
| 6 | 252 | 5,555 |
| 6.5 | 281 | 7,200 |
| 7 | 309 | 9,651 |
| 8 | 364 | 19,550 |

BY LB DATE FEB '79

LOUIS BERGER & ASSOCIATES INC.

SHEET NO. A10 OF

CHKD. BY _____ DATE _____

STONY BROOK SITE #3

PROJECT C-227SUBJECT DRAWDOWN COMPUTATIONS

Assuming no inflow into the reservoir and no tailwater.

| ELEV. | TOTAL STORAGE | DIFFERENTIAL STORAGE | DISCHARGE ACTUAL | DISCHARGE AVER. | AVERAGE DISCHARGE | DRAWDOWN TIME |
|--------|---------------|----------------------|------------------|-----------------|-------------------|---------------|
| FT | ACRE-FT | ACRE-FT | CFS | CFS | MGD | DAYS |
| 151.5 | 182 | | 43.1 | | | |
| | | 42 | | 42.2 | 83.7 | .5 |
| 150 | 140 | | 41.2 | | | |
| | | 45 | | 39.8 | 78.9 | .6 |
| 148 | 95 | | 38.4 | | | |
| | | 30 | | 36.9 | 73.2 | .4 |
| 146 | 65 | | 35.4 | | | |
| | | 25 | | 33.8 | 67 | .4 |
| 144 | 40 | | 32.1 | | | |
| | | 10 | | 30.3 | 60.1 | .2 |
| 142 | 30 | | 28.4 | | | |
| | | 10 | | 26.3 | 52.2 | .2 |
| 140 | 20 | | 24.2 | | | |
| | | 10 | | 21.6 | 42.8 | .2 |
| 138 | 10 | | 19.0 | | | |
| | | 5 | | 15.4 | 30.5 | .2 |
| 136 | 5 | | 11.8 | | | |
| | | 5 | | 5.9 | 11.7 | .4 |
| 134.75 | 0 | | 0 | | | |

Total $\Sigma 3.1$ days

$$Q = A \sqrt{\frac{2gH}{K_{\text{LOSSES}}}}$$

$$= \pi (75)^2 \sqrt{\frac{64.4H}{1.81}}$$

$$= 10.54 H^{1/2}$$

$$K_{\text{LOSSES}} = K_{\text{ENTRANCE}} + K_{\text{EXIT}} + K_{\text{FRICTION}}$$

$$= .5 + 1 + \frac{29.1(n)^2(L)}{r^{4.75}}$$

$$= 1.5 + \frac{29.1(.012)^2(20)}{375.633}$$

$$= 1.81$$

$$n = 0.012$$

$$L = 20 \text{ ft}$$

$$r = 2 \text{ (radius)}$$

BY DJM DATE _____
 CHKD. BY _____ DATE _____
 SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

SHEET NO. A11 OF _____
 PROJECT C-227

STONY BROOK W.S. 3

 STONY BROOK DAM ^{W.S. 3} INSPECTION NORTH GROUP C227
 BY D.J. MULLIGAN
 FEBRUARY 1979

JOB SPECIFICATION

| NQ | NHR | NMIN | IDAY | IHR | IMIN | METRC | IPLT | IPRT | NSTAN |
|-------|-----|------|------|-----|------|-------|------|------|-------|
| 100 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| JOPER | | | | | NWT | | | | |
| 3 | | | | | 0 | | | | |

SUR-AREA RUNOFF COMPUTATION

INFLOW TO RESERVOIR

| ISTAG | ICOMP | IECON | ITAPE | JPLT | JPRT | INAME |
|-------|-------|-------|-------|------|------|-------|
| 15 | 0 | 0 | 0 | 0 | 0 | 1 |

HYDROGRAPH DATA

| IHYDG | IUMG | YAREA | SNAP | TRSDA | TRSPC | RATIO | ISNOW | ISAME | LOCAL |
|-------|------|-------|------|-------|-------|-------|-------|-------|-------|
| 0 | -1 | 1.50 | 0.0 | 1.50 | 0.0 | 0.0 | 0 | 0 | 0 |

PRECIP DATA

| NP | STORM | DAJ | DAK |
|----|-------|-----|-----|
| 24 | 0.0 | 0.0 | 0.0 |

PRECIP PATTERN

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 0.06 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.09 | 0.09 |
| 0.11 | 0.11 | 0.30 | 0.70 | 1.70 | 0.40 | 0.40 | 0.20 | 0.16 | 0.14 |
| 0.07 | 0.06 | 0.06 | 0.06 | | | | | | |

LOSS DATA

| STKR | DLTKR | RTIOL | ERAIN | STRKS | RTIOL | STRTL | CASTL | ALSMX | RTIMP |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.0 | 0.0 | 1.00 | 0.0 | 0.0 | 1.00 | 0.50 | 0.10 | 0.0 | 0.0 |

GIVEN UNIT GRAPH, NUHGG= 18

| | | | | | | | | | |
|-----|------|------|------|------|------|------|------|------|------|
| 71. | 290. | 573. | 701. | 644. | 489. | 347. | 248. | 170. | 120. |
| 78. | 57. | 42. | 30. | 22. | 13. | 11. | 8. | | |

UNIT GRAPH TOTALS 3914. CFS OR 1.01 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.0 ORCSN= 0.0 RTIOR= 1.00

END-OF-PERIOD FLOW

| TIME | RAIN | EXCS | COMP Q |
|------|------|------|--------|
| 1 | 0.06 | 0.00 | 0. |
| 2 | 0.06 | 0.00 | 0. |
| 3 | 0.06 | 0.00 | 0. |
| 4 | 0.06 | 0.00 | 0. |
| 5 | 0.07 | 0.00 | 0. |
| 6 | 0.07 | 0.00 | 0. |
| 7 | 0.08 | 0.00 | 0. |
| 8 | 0.09 | 0.04 | 3. |
| 9 | 0.09 | 0.06 | 15. |

SUBJECT_____

LOUIS BERGER & ASSOCIATES INC.

STONY BROOK W.S. 3

PROJECT C-227

| | | | |
|----|------|------|-------|
| 10 | 0.09 | 0.06 | 44. |
| 11 | 0.11 | 0.08 | 87. |
| 12 | 0.11 | 0.08 | 137. |
| 13 | 0.30 | 0.27 | 198. |
| 14 | 0.70 | 0.67 | 322. |
| 15 | 1.70 | 1.67 | 650. |
| 16 | 0.40 | 0.37 | 1233. |
| 17 | 0.40 | 0.37 | 1848. |
| 18 | 0.20 | 0.18 | 2152. |
| 19 | 0.16 | 0.13 | 2093. |
| 20 | 0.14 | 0.11 | 1408. |
| 21 | 0.07 | 0.05 | 1481. |
| 22 | 0.06 | 0.04 | 1182. |
| 23 | 0.06 | 0.04 | 914. |
| 24 | 0.06 | 0.04 | 700. |
| 25 | 0.0 | 0.0 | 526. |
| 26 | 0.0 | 0.0 | 403. |
| 27 | 0.0 | 0.0 | 302. |
| 28 | 0.0 | 0.0 | 220. |
| 29 | 0.0 | 0.0 | 156. |
| 30 | 0.0 | 0.0 | 107. |
| 31 | 0.0 | 0.0 | 77. |
| 32 | 0.0 | 0.0 | 51. |
| 33 | 0.0 | 0.0 | 27. |
| 34 | 0.0 | 0.0 | 17. |
| 35 | 0.0 | 0.0 | 10. |
| 36 | 0.0 | 0.0 | 6. |
| 37 | 0.0 | 0.0 | 4. |
| 38 | 0.0 | 0.0 | 2. |
| 39 | 0.0 | 0.0 | 1. |
| 40 | 0.0 | 0.0 | 1. |
| 41 | 0.0 | 0.0 | 0. |
| 42 | 0.0 | 0.0 | 0. |
| 43 | 0.0 | 0.0 | 0. |
| 44 | 0.0 | 0.0 | 0. |
| 45 | 0.0 | 0.0 | 0. |
| 46 | 0.0 | 0.0 | 0. |
| 47 | 0.0 | 0.0 | 0. |
| 48 | 0.0 | 0.0 | 0. |
| 49 | 0.0 | 0.0 | 0. |
| 50 | 0.0 | 0.0 | 0. |
| 51 | 0.0 | 0.0 | 0. |
| 52 | 0.0 | 0.0 | 0. |
| 53 | 0.0 | 0.0 | 0. |
| 54 | 0.0 | 0.0 | 0. |
| 55 | 0.0 | 0.0 | 0. |
| 56 | 0.0 | 0.0 | 0. |
| 57 | 0.0 | 0.0 | 0. |
| 58 | 0.0 | 0.0 | 0. |
| 59 | 0.0 | 0.0 | 0. |
| 60 | 0.0 | 0.0 | 0. |
| 61 | 0.0 | 0.0 | 0. |
| 62 | 0.0 | 0.0 | 0. |
| 63 | 0.0 | 0.0 | 0. |
| 64 | 0.0 | 0.0 | 0. |
| 65 | 0.0 | 0.0 | 0. |
| 66 | 0.0 | 0.0 | 0. |
| 67 | 0.0 | 0.0 | 0. |
| 68 | 0.0 | 0.0 | 0. |
| 69 | 0.0 | 0.0 | 0. |
| 70 | 0.0 | 0.0 | 0. |

BY OJM DATE _____
 CHKD. BY _____ DATE _____
 SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

STONY BROOK W.S. #3

SHEET NO. A13 OF _____
 PROJECT C-227

| | | | |
|-----|-----|-----|----|
| 71 | 0.0 | 0.0 | 0. |
| 72 | 0.0 | 0.0 | 0. |
| 73 | 0.0 | 0.0 | 0. |
| 74 | 0.0 | 0.0 | 0. |
| 75 | 0.0 | 0.0 | 0. |
| 76 | 0.0 | 0.0 | 0. |
| 77 | 0.0 | 0.0 | 0. |
| 78 | 0.0 | 0.0 | 0. |
| 79 | 0.0 | 0.0 | 0. |
| 80 | 0.0 | 0.0 | 0. |
| 81 | 0.0 | 0.0 | 0. |
| 82 | 0.0 | 0.0 | 0. |
| 83 | 0.0 | 0.0 | 0. |
| 84 | 0.0 | 0.0 | 0. |
| 85 | 0.0 | 0.0 | 0. |
| 86 | 0.0 | 0.0 | 0. |
| 87 | 0.0 | 0.0 | 0. |
| 88 | 0.0 | 0.0 | 0. |
| 89 | 0.0 | 0.0 | 0. |
| 90 | 0.0 | 0.0 | 0. |
| 91 | 0.0 | 0.0 | 0. |
| 92 | 0.0 | 0.0 | 0. |
| 93 | 0.0 | 0.0 | 0. |
| 94 | 0.0 | 0.0 | 0. |
| 95 | 0.0 | 0.0 | 0. |
| 96 | 0.0 | 0.0 | 0. |
| 97 | 0.0 | 0.0 | 0. |
| 98 | 0.0 | 0.0 | 0. |
| 99 | 0.0 | 0.0 | 0. |
| 100 | 0.0 | 0.0 | 0. |

SUM 5.20 4.26 16777.

| | PEAK | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|--------|-------|--------|---------|---------|--------------|
| CFS | 2152. | 697. | 175. | 168. | 16776. |
| INCHES | | 4.32 | 4.33 | 4.33 | 4.33 |
| AC-FT | | 346. | 347. | 347. | 347. |

HYDROGRAPH ROUTING

ROUTING THROUGH RESERVOIR

ISTAG 115 ICOMP 1 IECUN 0 ITAPE 0 JPLY 0 JPRY 0 INAME 1

ROUTING DATA

GLOSS 0.0 CLOSS 0.0 AVG 0.6 IRES 1 ISAME 0

NSTPS 1 NSTOL 0 LAG 0 AMSKK 0.0 X 0.0 YSK 0.0 STORA 0.

STORAGE= 0. 32. 70. 110. 150. 196. 252. 281.
 OUTFLOW= 0. 118. 333. 824. 1920. 3530. 5555. 7200.

TIME EOP STOR AVG IN LOP OUT
 1 0. 0. 0.
 2 0. 0. 0.
 3 0. 0. 0.

A-13

BY DJM DATE _____
CHKD. BY _____ DATE _____
SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.
STONY BROOK W.S. #3

SHEET NO. A14 OF _____
PROJECT C-227

| | | | |
|----|------|-------|-------|
| 4 | 0. | 0. | 0. |
| 5 | 0. | 0. | 0. |
| 6 | 0. | 0. | 0. |
| 7 | 0. | 0. | 0. |
| 8 | 0. | 1. | 0. |
| 9 | 0. | 9. | 1. |
| 10 | 1. | 30. | 3. |
| 11 | 2. | 66. | 7. |
| 12 | 4. | 112. | 15. |
| 13 | 7. | 167. | 26. |
| 14 | 12. | 260. | 43. |
| 15 | 21. | 485. | 76. |
| 16 | 38. | 941. | 150. |
| 17 | 65. | 1541. | 304. |
| 18 | 96. | 2000. | 655. |
| 19 | 122. | 2122. | 1141. |
| 20 | 135. | 1951. | 1498. |
| 21 | 137. | 1645. | 1563. |
| 22 | 133. | 1332. | 1461. |
| 23 | 127. | 1048. | 1279. |
| 24 | 119. | 807. | 1071. |
| 25 | 112. | 613. | 869. |
| 26 | 104. | 464. | 756. |
| 27 | 97. | 352. | 665. |
| 28 | 90. | 261. | 574. |
| 29 | 83. | 188. | 487. |
| 30 | 76. | 132. | 407. |
| 31 | 70. | 92. | 336. |
| 32 | 65. | 64. | 304. |
| 33 | 60. | 39. | 275. |
| 34 | 55. | 22. | 247. |
| 35 | 50. | 13. | 221. |
| 36 | 46. | 8. | 198. |
| 37 | 42. | 5. | 176. |
| 38 | 39. | 3. | 157. |
| 39 | 36. | 2. | 140. |
| 40 | 33. | 1. | 125. |
| 41 | 31. | 0. | 113. |
| 42 | 28. | 0. | 105. |
| 43 | 26. | 0. | 97. |
| 44 | 24. | 0. | 90. |
| 45 | 23. | 0. | 84. |
| 46 | 21. | 0. | 77. |
| 47 | 19. | 0. | 72. |
| 48 | 18. | 0. | 66. |
| 49 | 17. | 0. | 62. |
| 50 | 15. | 0. | 57. |
| 51 | 14. | 0. | 53. |
| 52 | 13. | 0. | 49. |
| 53 | 12. | 0. | 45. |
| 54 | 11. | 0. | 42. |
| 55 | 11. | 0. | 39. |
| 56 | 10. | 0. | 36. |
| 57 | 9. | 0. | 33. |
| 58 | 8. | 0. | 31. |
| 59 | 8. | 0. | 29. |
| 60 | 7. | 0. | 27. |
| 61 | 7. | 0. | 25. |
| 62 | 6. | 0. | 23. |
| 63 | 6. | 0. | 21. |
| 64 | 5. | 0. | 20. |

BY DJM DATE _____
 CHKD. BY _____ DATE _____
 SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

STONY BROOK SITE # 3

SHEET NO. A15 OF _____
 PROJECT C-227

| | | | |
|-----|----|----|-----|
| 65 | 5. | 0. | 18. |
| 66 | 5. | 0. | 17. |
| 67 | 4. | 0. | 16. |
| 68 | 4. | 0. | 14. |
| 69 | 4. | 0. | 13. |
| 70 | 3. | 0. | 12. |
| 71 | 3. | 0. | 12. |
| 72 | 3. | 0. | 11. |
| 73 | 3. | 0. | 10. |
| 74 | 2. | 0. | 9. |
| 75 | 2. | 0. | 8. |
| 76 | 2. | 0. | 8. |
| 77 | 2. | 0. | 7. |
| 78 | 2. | 0. | 7. |
| 79 | 2. | 0. | 6. |
| 80 | 2. | 0. | 6. |
| 81 | 1. | 0. | 5. |
| 82 | 1. | 0. | 5. |
| 83 | 1. | 0. | 5. |
| 84 | 1. | 0. | 4. |
| 85 | 1. | 0. | 4. |
| 86 | 1. | 0. | 4. |
| 87 | 1. | 0. | 3. |
| 88 | 1. | 0. | 3. |
| 89 | 1. | 0. | 3. |
| 90 | 1. | 0. | 3. |
| 91 | 1. | 0. | 3. |
| 92 | 1. | 0. | 2. |
| 93 | 1. | 0. | 2. |
| 94 | 1. | 0. | 2. |
| 95 | 1. | 0. | 2. |
| 96 | 0. | 0. | 2. |
| 97 | 0. | 0. | 2. |
| 98 | 0. | 0. | 1. |
| 99 | 0. | 0. | 1. |
| 100 | 0. | 0. | 1. |

SUM 16760.

| | PEAK | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|--------|-------|--------|---------|---------|--------------|
| CFS | 1563. | 622. | 175. | 168. | 16760. |
| INCHES | | 3.86 | 4.33 | 4.33 | 4.33 |
| AC-FT | | 309. | 346. | 346. | 346. |

RUNOFF SUMMARY, AVERAGE FLOW

| | | PEAK | 6-HOUR | 24-HOUR | 72-HOUR | AREA |
|---------------|-----|-------|--------|---------|---------|------|
| HYDROGRAPH AT | 15 | 2152. | 697. | 175. | 168. | 1.50 |
| ROUTED TO | 115 | 1563. | 622. | 175. | 168. | 1.50 |